

## **ABSTRACT**

### **MAGNETIC BIAS PINNING LAYER FOR GMR SENSOR OF A MAGNETIC HEAD FOR A HARD DISK DRIVE**

5       A giant magneto-resistive (GMR) sensor for a magnetic head for a hard disk drive is disclosed. The sensor includes: a free magnetic layer; a bias layer that provides a bias magnetic field to the free magnetic layer and a bias pinning layer that provides a stabilizing magnetic field to the bias layer and that has a width substantially longer than the width of the free magnetic layer. Embodiments of the invention may further include  
10   an anti-ferromagnetic layer having a width substantially longer than the width of the free layer, or both an anti-ferromagnetic layer and a pinned magnetic structure each having a width substantially longer than the width of the free layer.